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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 25

Application Number: 09/559,347
Filing Date: April 27, 2000
Appellant(s): CHEN ET AL.

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Raj Davé
For Appellants

EXAMINER'S ANSWER

This is in response to the appeal brief filed January 17, 2003.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellants' statement of the status of amendments after final rejection contained in the brief is incorrect.

The amendment after final rejection filed on January 17, 2003 (i.e. substitute specification) has not been entered since it did not contain a statement as to a lack of new matter under 37 CFR 1.125(b).

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellants' statement of the issues in the brief is substantially correct. The changes are as follows: in issue (6), claims 5, 6, 14 and 15 have been previously cancelled and should be withdrawn from the list of claims rejected for obviousness-type double patenting over Chen '890 in view of Ross.

(7) Grouping of Claims

The appellants' statement in the brief that certain claims do not stand or fall together is substantially correct. The changes are as follows: claims 5, 6, 14 and 15 have been previously cancelled and should be withdrawn from the list of claims.

The rejection of claims 2, 3, 8, 9, 11, 12, 17, 18 and 21 - 25 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5,480,733	OKUMURA ET AL.	1-1996
5,733,370	CHEN ET AL.	3-1998
6,416,881	HUANG ET AL.	7-2002
5,874,376	TAGUCHI ET AL.	2-1999

6,120,890	CHEN ET AL.	9-2000
5,980,997	ROSS ET AL.	11-1999
6,183,828 B1	STARCKE ET AL.	2-2001

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 2, 3, 8, 9, 11, 12, 17, 18 and 21 - 25 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 - 20 of Chen et al. ('890) in view of Ross et al. ('997).

Regarding claims 21 - 23, Chen et al. ('890) claim a longitudinal or perpendicular magnetic recording medium comprising in this order: a glass or glass-ceramic substrate comprising Li, a sealing layer comprising substantially amorphous material directly deposited on the glass or glass-ceramic substrate, and a magnetic layer; wherein the sealing layer substantially prevents migration of Li from the substrate to the magnetic layer of the magnetic recording medium (*claim 1*). Chen et al. ('890) further claim overlapping thickness values with appellants' claimed limitations (*claim 6*).

Chen et al. ('890) further disclose all the additional limitations in appellants' dependent claims 2, 3, 8, 9, 11, 12, 17 and 18 (*claims 2 – 5 and 10 – 20*).

Chen et al. ('890) fail to claim using NiNb as the sealing layer, though Chen et al. ('890) does disclose that Nb can be added to the claimed sealing layer (*claim 7*).

However, Ross et al. ('997) teach that amorphous NiNb and NiP are art recognized equivalents in terms of underlayers directly deposited on glass or ceramic

substrates (*col. 2, lines 1 – 23 and lines 40 – 44; col. 3, lines 29 – 47; col. 7, lines 16 – 50; col. 8, lines 3 – 25; and claim 1*). Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, NiP and NiNb are equivalents in the field of underlayers directly deposited on glass or glass-ceramic substrates. *In re Fount* 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

It would therefore have been obvious to one of ordinary skill in the art at the time of the appellants' invention to modify the device of Chen et al. ('890) to include a NiNb sealing layer as taught by Ross et al. ('997) since one of ordinary skill in the art would recognize that NiP and NiNb are known equivalents and the substitution of known equivalents is within the knowledge of one of ordinary skill in the art, especially given that Chen et al. ('890) disclose NiNbP as claimed subject matter (*claim 7*).

With regard to claims 24 and 25, Chen et al. ('890) claims a weight percent Li overlapping appellants' claimed limitations (*claim 1*).

Claims 2, 11, 18 and 21 - 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ross et al. ('997) in view of Starcke et al. ('28 B1) and Taguchi et al. ('376).

Regarding claims 21 - 23, Ross et al. disclose a longitudinal or perpendicular recording medium comprising, in this order: a glass or glass-ceramic substrate (*Figures 1C and 4 – element 112*), a sealing layer comprising substantially amorphous NiNb

directly deposited on the glass or glass-ceramic substrate (*Figure 4 – element 119; wherein the Cr adhesion layer 114 is disclosed as optional – col. 4, line 52 and col. 8, lines 1 - 2; example 2; and claim 1*), and a magnetic layer (*Figure 1C – element 122*); wherein the sealing layer has a thickness of about 450 Å or less (*col. 8, lines 16 - 18*).

The exact thickness of the sealing layer is deemed a cause effective variable in terms of bump heights and overall medium cost (*col. 8, lines 18 – 19 and lines 64 – 67*) and it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the sealing layer thickness through routine experimentation. *In re Boesch*, 205 USPQ 215 (CCPA 1980), *In re Woodruff*, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

It has been held that where claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established and the burden of proof is shifted to appellant to show that prior art products do not necessarily on inherently possess characteristics of claimed products where the rejection is based on inherency under 35 USC 102 or on *prima facie* obviousness under 35 USC 103, jointly or alternatively. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the appellant and the prior art are the same, the appellant has the burden of showing that they are not." *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the *prime facie* case can be

rebutted by ***evidence*** showing that the prior art products do not necessarily process the characteristics of the claimed product. *In re Best*, 562 F.2d at 1255, 195 USPQ at 433.

Therefore, in addition to the above disclosed limitations, since the prior art product is substantially identical in both structure and composition (i.e. a sputtered amorphous NiNb layer (*col. 7, lines 20 – 22*) directly deposited on a glass substrate (*col. 8, lines 1 – 2*), the Examiner deems that there is sound basis for a position that the limitation "substantially prevents migration of Li from the substrate to the magnetic layer" would necessarily have been present in the disclosed NiNb layers of the Ross et al. ('997) invention, and there is no evidence of record showing that the disclosed NiNb layers do not necessarily possess the characteristics of the claimed product.

As supporting evidence for the "sound basis for believing that the products of the appellants and the prior art are the same", the examiner notes that Ross et al. ('997) disclose that NiP is known to prevent migration of Na ions (*col. 3, lines 12 – 19*) and Starke et al. teach that a well adhered NiP layer prevents migration of all alkali ions (i.e. including Li) (*col. 2, lines 45 – 52; col. 3, lines 3 – 17; and col. 3, line 62 bridging col. 4, line 8*). Since Ross et al. ('997) teach that NiNb and NiP are equivalent (*examples*) and does not provide any evidence that NiNb would not also possess the disclose Na encapsulating property, the Examiner deems that there is sufficient evidence to support a basis that NiNb would behave in a similar manner as it's disclosed equivalent – NiP.

Neither Ross et al. ('997) nor Starcke et al. disclose using a glass substrate comprising Li.

However, Taguchi et al. teach a glass substrate for magnetic recording media which can be easily formed, polished and chemically strengthened wherein the substrate comprises lithium (*col. 2, lines 31 – 65; col. 4, line 37 bridging col. 5, line 17; col. 11, lines 27 – 38; and Examples*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the appellants' invention to modify the device of Ross et al. ('997) in view of Starcke et al. to use a glass substrate comprising lithium as taught by Taguchi et al. inorder to produce a glass substrate for magnetic recording media which can be easily formed, polished and chemically strengthened.

Regarding claims 2 and 11, Ross et al. ('997) disclose underlayers and protective coats (*col. 6, lines 19 - 30*) and Taguchi et al. disclose weight percent Li_2O meeting appellants' claimed limitation (*Examples*).

Regarding claim 16, Ross et al. ('997) disclose sealing layers meeting appellants' claimed thickness range, as well as teaching that thinner layers are preferred and that thin layers can be formed by using NiNb since the laser power can be adjusted appropriately to control the bump heights (*col. 8, lines 16 – 25 and lines 51 – 67*). The exact thickness of the sealing layer is deemed a cause effective variable in terms of bump heights and overall medium cost (*col. 8, lines 18 – 19 and lines 64 – 67*) and it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the sealing layer thickness through routine experimentation.

Regarding claim 18, Ross et al. ('997) disclose sealing layer compositions meeting appellants' claimed limitations (*col. 7, lines 16 – 24*).

Claims 3 and 12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ross et al. ('997) in view of Starcke et al. and Taguchi et al. as applied above, and further in view of Chen et al. (370).

Ross et al. ('997) in view of Starcke et al. and Taguchi et al. are relied upon as described above.

None of Ross et al. ('997) in view of Starcke et al. and Taguchi et al. disclose oxidizing the surface of the sealing layer.

However, Chen et al. teach that oxidizing the surface of a NiP underlayer results in the formation of a magnetic recording medium exhibiting low noise and high coercivity (*col. 2, lines 55 – 62; col. 3, line 51 bridging line 17*).

Since NiP is an art recognized equivalent to NiNb (*see above – Ross et al. '997*), it would therefore have been obvious to one of ordinary skill in the art at the time of the appellants' invention to modify the device of Ross et al. ('997) in view of Starcke et al. and Taguchi et al. to use a surface oxidized NiNb sealing layer as taught by Chen et al. inorder to produce a magnetic recording medium exhibiting low noise and high coercivity.

Claims 8 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ross et al. ('997) in view of Starcke et al. and Taguchi et al. as applied above, and further in view of Okumura et al. ('733).

Ross et al. ('997) in view of Starcke et al. and Taguchi et al. are relied upon as described above.

While Ross et al. ('997) disclose that additional elements may be used in place of Nb, including elements meeting appellants' claimed limitations, Ross et al. ('997) in view of Starcke et al. and Taguchi et al. fail to disclose a NiNb sealing layer further comprising a third element meeting appellants' claimed limitations.

However, Okumura et al. teach adding elements meeting appellants' claimed limitations, including NiNbP, inorder to control the melting point and crystallization properties of the layer (*col. 4, lines 7 – 20; col. 5, lines 1 – 11 and Table 1*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the appellants' invention to modify the device of Ross et al. ('997) in view of Starcke et al. and Taguchi et al. to include additional elements meeting appellants' claimed limitations as taught by Okumura et al. inorder to optimize the melting point and crystallization properties of the sealing layer.

Claims 9 and 19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ross et al. ('997) in view of Starcke et al. and Taguchi et al. as applied above, and further in view of appellants' admissions.

Ross et al. ('997) in view of Starcke et al. and Taguchi et al. are relied upon as described above.

Ross et al. ('997) in view of Starcke et al. and Taguchi et al. fail to disclose a CoCrPtTa magnetic layer, with or without a CrV underlayer.

However, appellants admit that CoCrPtTa magnetic layers with CrV underlayers are known in the art as conventional longitudinal media on glass substrates (*page 4, lines 3 – 10*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the appellants' invention to modify the device of Ross et al. ('997) in view of Starcke et al. and Taguchi et al. to use a CoCrPtTa magnetic layer, with or without a CrV underlayer as admitted by appellants depending on the desired cost and magnetic performance required.

Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ross et al. ('997) in view of Starcke et al. ('828) as applied above, and further in view of appellants' admissions.

Ross et al. ('997) in view of Starcke et al. ('828) are relied upon as described above.

Neither reference discloses a Li containing substrate meeting appellants' claimed limitations.

However, appellants' admit that it is old in the art to add lithium in a weight percent meeting appellants' claimed limitations inorder to lower T_g and, therefor, make processing the glass easier (*page 6, lines 1 – 6*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the appellants' invention to modify the device of Ross et al. ('997) in view of Starcke et al. ('828) to use a glass substrate comprising Li in an amount meeting appellants' claimed limitations as admitted to by appellants inorder to lower T_g and to make processing of the glass substrate easier.

(11) Response to Argument

Appellants' initial argument is that the Examiner has relied upon hindsight to create the disclosed invention, specifically that the prior art does not disclose that NiP and NiNb are known to prevent the migration of alkali (e.g. Li) ions. The Examiner respectfully disagrees.

As acknowledged by appellants, Ross et al. teach that NiP can encapsulate Na ions (*col. 3, lines 12 – 18*). Starke et al. also states that NiP can encapsulate <u>all</u> alkali ions (Li is a known alkali ion, in addition to Na) (*col. 3, line 67 bridging col. 4, line 2: "The nickel phosphorus plating of a glass substrates eliminates problems of corrosion as it encapsulates* ***all the alkaline metal ions*** *which may leach out*", emphasis added). Since Ross et al. further disclose using both NiP or NiNb as the layer deposited on the glass substrate (*examples*) and never mentions that NiNb is worse than NiP in terms of encapsulating Na ions, the Examiner deems that one of ordinary skill in the art would

have been reasonably appraised that NiNb would possess the same sealing properties as NiP. Nevertheless, the Examiner notes that the above logic was supplied purely as supporting evidence for the Examiner's **sound basis** for believing that the textured NiNb layer would necessarily possess the claimed Li prevention property (see rejections of record).

In addition, appellants argue that the declaration supplied by Dr. Caroline Ross (Paper No. 18) is sufficient to overcome the inherency argument provided by the Office. The examiner respectfully disagrees.

The Examiner assumes that appellants are referring to the "necessarily present" rejection by its corollary – "inherency". As stated in the response to Paper No. 18, the declaration was carefully considered, but was not found to be persuasive. The declaration was not found convincing because appellants provided no evidence to support their allegation that "the process of laser texturing ... **may** adversely affect the diffusion barrier properties of the layer" (Declaration of Dr. Ross, Paragraph 9, lines 9 – 10). Since even Dr. Ross is uncertain as to whether the laser texturing would prevent the Li ion migration, the Examiner deems that additional evidence is necessary.

Appellants subsequently argue that since there are no products of the prior art by which to compare against, that the Examiner has not met the burden of a *prima facie* case of either anticipation or obviousness. The examiner respectfully disagrees.

Appellants have stressed that the two closest pieces of prior art cannot be reasonably compared against since Taguchi et al. (which teaches the Li containing substrate) does not possess any NiP or NiNb layer and Ross et al. (which teaches the

NiNb layer) does not possess a substrate containing Li. The Examiner notes that the combination of Ross et al. with Taguchi et al. is deemed proper for the reasons of record, even if they are different than the reasons disclosed by appellants. As such, it is the Examiner's impression that the property that is "necessarily present" is not an inherent property of the medium as a whole, but of the specific textured NiNb layer disclosed by the Ross et al. patent. This issue has been raised by the Examiner previously (see Paper No. 10) and the Examiner deems that the property is of the NiNb layer itself and that a showing that the NiNb layer no longer prevents Li ion migration once it has been laser textured would be sufficient to distinguish the claimed invention over the prior art. Presently, no such evidence has been provided.

Appellants also argue that the Examiner is requiring them to compare the claimed invention against a hypothetical piece of prior art that would be the *same* as the claimed product. The examiner respectfully disagrees.

First, if the "hypothetical piece of prior art" was indeed the same as appellants' claimed product, then it would be well within reason to assume that the claimed properties would necessarily be present. However, that is not the case. In the present case, the "hypothetical piece of prior art" possesses a laser textured NiNb layer, which appellants claimed invention does not. It is the effect of laser texturing on the NiNb layer which is the entire basis for the question on whether the Li ion migration would necessarily be present in the "hypothetical piece of prior art".

Finally, appellants argue that the examiner has misinterpreted "sealing means" and "substantially preventing the migration of Li". The examiner respectfully disagrees.

The examiner notes that the relied upon disclosure merely refers to what the layer can do, not what it must do (or always does). I.e. if the language was "...a layer that reduces Li concentrations on the surface of the magnetic media to less than 500 counts/minute", it would have been a clear definition of what was meant by "substantially preventing the migration of Li". The Examiner further notes appellants' data in Table 1, which clearly shows embodiments with thickness values of 450 Å or less and Li counts exceeding 500/min.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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February 19, 2003

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